Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments -- W. W. Dinwiddie Disc Books
Notebook, N-18-08-14

This notebook was used by William W. Dinwiddie during August-December 1918 for notes on the production of disc record blanks. Edison's supervision of this work is indicated by Dinwiddie's references to his suggestions and his comments that Edison personally tested some of the materials. The experiments are numbered from D101 through D197. The entries indicate differing methods of preparation involving variations in the baking schedules and methods of applying the varnish and the use of different ingredients, combinations of ingredients, and varnishes. There are also illustrations of various ways to set up the presses and molds. Most entries contain comments about the results of the experiments, including whether the disc was too soft, sticky, or stiff and whether it had swell-ups, warps, or cracks. Also included is a description of an experiment "to determine what metals are most liable or less liable to stick to blanks when used as moulds." There are occasional lists of chemicals and other materials ("materials obtained in N.Y."), along with notations regarding their characteristics, sources of supply, and prices. Inserted into the book is a 2-page memorandum from Dinwiddie regarding the procurement of stearic acid in New York City, along with Edison's response. The notes indicate that Charles T. Dally and Ludwig F. (Louis) Ott were working on related experiments. The front cover is labeled "Dinwiddie D-101 — 200/++/." The pages are unnumbered. Approximately 110 pages have been used.

Gears on Mixing Machine

face	hole			pitch diam	blank diam
1 1/4	1 1/4	6 pitch	16 teeth	2.666	
1 1/4	1 3/16	6 "	65 teeth	10.833	

C13

D101 Materials obtained in New York $45.00 & $60.00

(1) Ground Rottenstone T. Van Antwerp & Son.
(2) Finely powdered Earth - Fuerst Bros & Co.
(3) 400 U.S. Silica - J. Lee Smith & Co. $90.00
(4) "Clay Lox" Natural Earth " 40.00
(5) C.P.N. Chem. Co. No 9 Blanc Fixe ~~Stearate~~ Calcium
(6) " " " No 10 ?
(7) " " " No 11 Contains large crystals
(8) corn starch very uniform filming
(9) M. Ewing Fox Company Inc. Clay $40.00
(10) " " " " Paris White $40.00
(11) " " " " Magnesium Silicate $50.00
(12) J. Lee Smith W.F. 400 Silica cheaper than (3)
(13) Geo. W. Gooch E.G.W. Whiting (Paris White) $1.85 cwt.
(14) Kieselguhr Co of America - California Kieselguhr
(15) Whittaker Clark & Daniels Kieselguhr -
(16) Calcium Carbonate 3.J. Air floated Indust.
(17) Calcium Carbonate No 5 - Ground limestone
(18) " " No 6 Ground lime stone
(19) Toch Bros "Colloidal" Blanc Fixe
(20) Hill Crosset D-C Filler
(21) " " 3 bear filler

apparently not air floated -
lesseps .003 + (infusorial Silica?)
Aluminite libre amorphe rottenstone -
Clay crystals .004
and Magnesia -
finer than (5)
and metal
globules -
No grit - few flakes -
V. fine
Kieselguhr - Very fibrous -

full of grit.
Chem. not as fibrous as (11)
Granular
Chem. Co. as good as precip. chalk -
N.G. Crystals
N.G. Crystals.

D-102

250 g shellac XXPP No 3
10 g gas black.
740 g blanc fixe.
1000 total

very soft and sticky on rolls —

8-103 Varnish experiment—
Bentonite in alcohol enough
to cover after standing all night.
2 coats put on and baked
regular way.

D-104 Materials Obtained in New York.

(1)	Imperial Color Works, Glens Falls, N.Y.	
(2)	Siemon & Eting Alumina Hydrate.	Alumina Hydrate.
(3)	" " Barium Sulphate 9109	
(4)	" " Terra Alba No 1	
(5)	L. H. Butcher Superwhite - Calcium Carbonate $25.00	Marble dust -
(6)	John C. Warda Co. Infusorial Earth	
(7)	" " " Blanc Fixe	
(8)	" " " China Clay	large mica crystals -
(9)	" " " Fullers Earth	looks like clay has mica crystals -
(10)	" " " Precipitated chalk	
(11)	" " " Tripoli very coarse Quartz	
(12)	" " " Silica " " "	
(13)	" " " Whiting precip chalk - bi-product	
(14)	Hanshaw Fuller & Goodwin Co. N.Y. Dimitic Rottenstone	2½ ¢ not the floated -
(15)	" " " " Imported "	3 ¢ " " " clay crystals -
(16)		
(17)		
(18)		
(19)		
(20)		

Dally's Mix No - 70.

(10 times)

12000g. Rosin melted
28g. Cotton floc.
3000g. Chalk -

for 3gal mixer

Floc first in mixer -
then all melted rosin -
then add 1/5 of chalk at a time
until all is in and mix for
1/2 hour longer -
too much for mixer

9600g Rosin -
230g cotton -
2400 chalk -

8 disc
patch

Blanks made with chalk double up
in baking - Mix 2, 2mg grated rosin
more pace and lower temp, in baking

D-105-

Cob of clay - rosin - floc - straw oil
and Solvent naptha - Dally's mix No 40-41
pressed in hydraulic press between two
pieces of paper.

Too much rosin in mix relative
to Solvent naptha makes it stick.
Solvent naptha on the paper helps.

115 cc Solvent Naptha
10 grams straw oil
100 g rosin
29 g floc
300 g clay
554 g total

silk
Linen
Leather
brass wire mesh
} works better than paper
best.

D-106- Aug 14-18

Put regular varnished blanks in vacuum drier heated to 120°- could not detect any softening with finger nail.
heated to 130°- seemed to scratch a little easier but very little.
heated to 140°- easier to scratch, but direct pressure with finger nail did not leave a mark.
heated to 150°- direct pressure with finger nail makes a slight dent in the varnish.

This vacuum drier will not get hot enough for varnish blank baking

Aug 21 – Aug 23-18

D-107

Hydraulic press platten heated with hot water circulation
Thermometer in tank.
Platten at 55° Cent – 131° F
no sign of sticking to mould – only 525 lbs pressure on accumulator – not sufficient, see last page this book
Platten at 60° C – 140° F blanks stick to mould –
Platten at 57° C do not stick so that pull outs are covered.

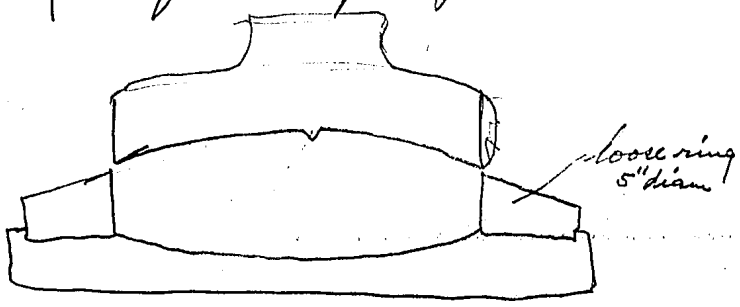
D108 Aug 24-1918

Hydraulic press operated from accumulator 700 lbs pressure. Platens heated by hot water circulation 57° C. = 134 3/5° F. Blankets heated in oven laid flat on a transfer plate for 40 min. (Blankets stood on edge in the oven always are softer on one side than the other, even after 6 hours.)

Blankets heated on steam plate covered with pasteboard are OK but gob must be hot

used Dally's Mix No 70 See page ~~[illegible]~~ opposite 105

D 109
Mould for Press for gobs —



Center pin in plunger on arbor press - leaves a center mark on gob to center the gob in hydraulic press.

see D117 etc

D-110

Dallegs No70 = 960 Rosin = 26.6%
230 Cotton floc = 6.5%
2400 Chalk = 66.9%
total 100.0

No79 is same as this except clay for chalk

D-110
1000 g Rosin = 25%
240 g Cotton = 6%
2760 g Chalk = 69%

D 111

125 g Rosin
30 g Cotton floc
345 + 90 = 435 g AX Rotten Stone –

– Mix is a little too dry –

Too dry and stiff to make a good blank –

D112

125 g Rosin
30 g Cotton flock
380 g Dx cotton flock

A little too stiff
not quite enough material
to make a blanket

see-D133

D 113

125 g Rosin 25%
30 g Cotton Floc 6%
345 g AX Rotten Stone 69%

7 times for 3 gal

875 g Rosin
210 g Cotton
2415 g AX Rotten Stone

8 times

1000 g Rosin
240 g Cotton
2760 AX

Mr. Edison Tested following materials for iron —
his notes as follows.

Chalk. not much iron

Magnesia Silicate very little iron. HCl decomposes some and free silica precipitated.

China clay very little iron.

Lion clay no iron O.K.

Rotten Stone Awful. 1/3 iron. N.G.

Lithophone no iron acid decomposes it some giving precipitate soluble in KOH & also ammonia.

D114

125g Rosin. (19%)
30g Cotton (4½%)
345 + 138 = 483g Blanc Fixe (75½%)

Not quite enough to make a full blanket — Seems O.K.

See 132

D115

125 g Rosin
30 g Cotton floc
265 g 400 mesh Silica

tried 345 g Silica twice and made very crumbly mix -

D-16

One quart regular 1841-E varnish -
varnish contains about 3.75 g. para
236 cc contains .94 g "
add 2.82 g "

Wally Pho 77 — 236 cc contains 7.56 g 6/4
add 2.06 g 6/4

Bake on schedule 1/2 hour 110° F
1/2 hour 120°
3/4 hour 140°
1 hour to 150°
hold at 150° for 5 hours,

blanks warped very bad -

#2 Schedule - 1/2 hour at 110°F
3/4 hour at 120
1 hour at 130
1 hour at 140
hold at 140° for 7 hours

D-117

1000g Rosin 25%
280g Cotton 7%
2720 Chalk 68%
4000g total

D118 1000 g Rosin 25%
320 g Cotton 8%
2680 g chalk 67%
4000

D119

1000 g Rosin 25%
360 g Cotton 9%
2640 g chalk 66%
4000 g

D120

1000 g Rosin 25%
400 g Cotton 10%
2600 g chalk 65%
4000 g

too dry - tried 2d time and was too crumbly to stick together in gob - too stiff to press out in press - see 122

D-121	1080 g.	Rosin	27%
	400 g.	Cotton	10%
	2520 g.	Chalk	63%
	4000 g.		100%

better than 121 but too dry.

D-122 · 1200 g Rosin 30%
400 g Cotton 10%
2400 g chalk 60%
4000 g 100%

O.K.

This was the only one perfectly flat in a lot of 20 baked in oven after varnishing. (115-126 inc) two were of this number - the other one was slightly warped

C45]

D-123-	Rosin	1280	32%
	Cotton	480	12%
	Chalk	2240	56%
		4000	100%

OK on mixing -

D124	Rosin	1400	35%
	Cotton	600	15%
	Chalk	2000	50%
		4000	100

Good but more rosin than needed

Sept 12-18

D-125

Rosin	1320	33%
Cotton	600	15%
Chalk	2080	52%
	4000	100

O.K. on mixing & blanket OK

CSJ

Accumulator weight increased by
old platters! Sept 13-18

D-126

Rosin	1080	27%
Cotton	320	8%
Chalk	2600	65%
total	4000	100%

OK on mixing - [illegible]

D127

126 Blank-
circulating water in press 47°
Oven 145°
Hydraulic pressure 925-0
does not stick

D128

118 Blank
Circulating water in press 55°
Oven 145°
Hydraulic Pressure 925-0
does not stick.

D129 Blank with two pencil marks on edge 1/8 inch from face

line appears on blank badly broken
average distance about 1" from edge
1"5/8 to over the edge

D130 Blank with pencil circle on each face 1/8 inch from edge

same as 129 but average 2" from edge
1"/2 to 2"1/2 from edge

D131 Rosin 960 g 24%
Cotton 320 g 8%
Chalk 2720 g 68%
4000 100

works good

See 114

D-132 140 g Rosin 20%
35 g Cotton 5%
525 g Blanc Fixe 75%
700

Made a good consistency gob.
Put the gob on steam plate at
10 42 AM. Sept 26.-18
Taken off - OCT 4-18 turned brown
same proportions by more (1% = 9)
180 g Rosin
45 g Cotton.
675 g Blanc Fixe.
900

1260 Rosin
315 Cotton
4725 Blanc Fixe
6300

Moulds heat at 118°F 122°F sticks
to moulds -
Varnished and baked printed on regular
schedule in flash mould Oct 23 stuck
all over mould. See page opposite 165

see D113

D-133

175 g Rosin 25%
42 g Cotton floc 6%
483 g Magnesium Silicate 69%

too dry will not make a gel.

D-134

210 Rosin 30%
42 Cotton Floc 6%
448 Magnesium Silicate 64%
700 total

Makes a good looking gob

1260 Rosin
252 Cotton floc
2688 Magnesium Silicate
4200 total

Warps in oven at 130°
Shows a lot of "swell-ups"

(155)

D-135

See 138

175 Rosin 25%
42 Flac 6%
483 Plaster Paris 69%
700

too dry

(138) is too soft to handle
gob just in figures in a
ball

D-136

204 g Rosin.
6 cc ~~Stearic~~ Oil } 30%
42 gr Cotton floc. 6%
448 gr Magnesium Silicate 64

1234 g Rosin
36 cc Stearic Oil
252 g cotton floc
2688 g Magnesium Silicate

D-137

218	Brain	30%
42	Cotton	6%
448	400 Tuan Million	64%
700		

Very soft too soft to handle job - put it in press in a bell - stuck to top - broke

D-138

210	Rosin	30%
42	Cotton	6%
448	Plaster Paris	64%

too soft to handle
got put in the press
in a ball

Blank varnished and baked at 130°F
crumpled up – entirely too soft.

(see 134)

D-139

224	Rosin	32%
42	Cotton	6%
434	Magnesium Silicate	62%
700		

1344	Rosin
252	Cotton
2604	Magnesium Silicate
4200	

D-140

231	Rosin	33%
42	Cotton	6%
427	Magnesium Silicate	61%
700		100%

1386	Rosin
252	cotton
2562	Magnesium Silicate
4200	

did not make this –

D-141

238	Rosin	34%
42	Cotton	6%
420	Magnesium Silicate	60%
700		

1428	Rosin
252	Cotton
2520	Magnesium Silicate
4200	

Makes a gob too soft to handle – varnished blank baked at 130°F crumpled up & very much too soft

D-142

1176	Rosin	28%
4552	Cotton	6%
4772	Magnesium Silicate	66%

Dally's No 98	1320	Rosin	33.4 %
	230	Floc	5.8
old clay med.	2400	clay	60.8
	3950	too dry.	

Dally's No 99	1420	Rosin	35%
	230	Floc	6%
old clay med.	2400	clay	59%
	4050	dry enough.	

D143

		large mix	small mix	
	Rosin	1428	238	34%
Dust	Cotton	252	42	6%
Lion	Clay	2520	420	60%
		4200	700	100%

Makes a very much softer gob than the ~~[illegible]~~ old clay.

D144	large mix	small mix	
Rosin	1470	245	35%
Dust Cotton	252	42	6%
Lion Clay	2478	413	59%
	4200	700	100%

With Lion clay the gob is entirely too soft to handle - it runs out to double diameter on the oven and gob runs together.

D145	Large mix	Small Mix	
Rosin.	1512	252	36%
Dust cotton.	252	42	6%
Lion Clay.	2436	406	58%
	4200	700	

Not made with Lion Clay
too soft

D146	Large mix	Small mix	
Rosin	1554	259	37%
~~Dust~~ Cotton	252	42	6%
~~Lion~~ Clay	2394	399	57%
	4200	700	

With the old clay this is about the maximum amount of rosin that can be used. 29 is a little more stiff than #147 made with Lion Clay.

D 147

210 Rosin 30%
42 Cotton 6%
448 ~~[illegible]~~ Lion Clay 64%
700 total -

1260 rosin
252 Cotton
2688 Lion clay
4200 Total -

147 Made with Lion clay is softer than 146 made with the old clay from Schuch

C913

D-148

210	Rosin	30 %
70	Cotton	10 %
280	Magnesium Silicate	40 %
140	Blanc Fixe	20 %
700		100

1260 Rosin
420 Cotton
1680 Magnesium Silicate
840 Blanc Fixe
4200 total.

This blank made with circulating water at 110° F has a decided tendency to stick in the mould — but it makes a proportionately perfect fill. Makes a good stiff gob.

For the stiffness of the gob it makes the best finish of anything tried. even better than 132

D-149

Experiment to determine what metals are most liable or less liable to stick to blanks when used as moulds.

Sheet of each metal laid in mould in hydraulic press - paper laid on top of gob to keep from sticking to other half of mould. Left on blank to cool.

Brass		* no apparent tending to stick
Copper		Hard rubber seemed nearer
Zinc	*	to sticking than any of the
Nickel		metals. but none were
Aluminum	*	stuck at all like the blank
Lead		sticks in the press.
Tin plate	*	Note Plates were not in perfect
Iron oxidized		contact and ~~not~~ quite so
Hard rubber		hot as the mould. also

when plates are left on the blank to cool conditions are quite different from the mould in the press even when cooled with water. plates and blank shrink apart without pull outs. above tried with D134 mix and temperature of water in press 160° F.

With steam on the platens Zinc, Aluminum and tin plate stuck fast. and remained stuck for 4 days. Oct 8-1916 - Removed after hammering with wood block. No appreciable pull outs, but traces on all three.

D150

Weigh out 3 lots of cotton 500 each.
Weigh out 1000 Rosin.
Prepare ~~[illegible]~~ 500 more Rosin.
Weigh out 4 lots chalk 500 each.

Rosin	1500	40.5
Cotton	700	19.
Chalk	1500	40.5
	3700	

500 cotton
500 chalk } at 10.10
1.000 Rosin

500 chalk at 10.20

200 cotton at 10.30

500 chalk at 10.40 looks granular

500 Rosin – 10.45 } looks OK when taken out

at 11.20 500 gr. made into blank.

D-150

Rosin	1500	40.5%
Cotton	700	19%
Chalk	1500	40.5%
	3700	

Added cotton and Rosin with mixing begun gradually adjusting until consistency was right to make a gob.

Blank marked D150-A
~~was marked out [illegible]~~
~~that [illegible]~~

Varnished with two coats of reg varnish except that 3% of Pina was added.
Baked 1 hr to 110°
1 hr to 120°
3 hrs to 140°
6 hrs at 140°
remained flat –

D-151

Rosin.	1500	40%
Cotton.	750	20%
Chalk.	~~Starch~~ 1500	40%
	3750	

Put in } 400 cotton
} 1000 Chalk - wet
} 1500 Rosin
add slowly 350 cotton after mixed thoroughly.
then add 500 chalk a little at a time,
Varnished and baked regular did not bend or warp appreciably
Printed regular - full print but rosin stuck out thru the varnish all over unusic N, Ct, Too much Rosin,
Examined 2004 - fine cracks all over.

See 125

C99J

D152

Rosin	30%	210 gr.
Cotton	30%	210 gr.
Chalk	40%	280 gr.
		700

Mix on rolls —

too dry — crumbled on rolls.
tried to make blank but too dry and crumbly.

D-153

Rosin	40 %	320 g
Cotton	30 %	240
Chalk	30 %	240
		800

Mix on rolls –

Made a crumbly mix – put in press with steam on platens, made a very shiny blank but stuck slightly. needs more chalk. See D156 and also D152

D-154.

Water (1700 cc.)		
Starch	300 g	12%
Cotton	400	16%
Chalk	1800	72%

Added chalk and cotton gradually gave a beautiful smooth mix in one hour, but too wet. ran mixer 3 hours more to dry it out. used solvent naptha on moulds to prevent sticking—

Blanks curl up when dried flat on pieces of cardboard.

Composition is porous and fairly strong. probably not plastic under heat of printing press.

D-155

217 g glue
1600 cc water
400 g cotton
1800 g chalk
start 9 ~~10~~ Am Oct 10.

glue soaked in water over night and warmed up till dissolved —

all glue
all cotton
⅔ chalk

200 cc water added as mix was all in fine balls about 1/8 diam.
580 G chalk added 1^00 Am

No good - could not make a blank - not enough glue or chalk paste

D-156

Rosin	35%	280
cotton	25%	200
Chalk	40%	320
		800

Mixed on rolls - crumbly but makes a solid gel.
Baked regular bake in 24 Building + very slightly warped

D 157

2000 g Alum crystals melted and drove off water until it was tough sticky mass when cold. crust left on bottom of pan entirely dehydrated.

put in large mixer with 500 g chalk and 200 g cotton. Stalled the machine before completely mixed. made imperfect blank. stuck to cold mould.

N.G.

D.158

Montagne wax	210	30%
Cotton	105	15%
Chalk	385	55%

took a very long time to mix and then was in small balls, but struck together OK in blanks.

D-159

Rosin	140	20%
Manila Cyl	140	20%
Cotton	112	16%
Chalk	308	44%

Rosin	840
Manila	840
Cotton	672
Chalk	1848
	4200

In ten minutes all cotton and chalk in- ten minutes more and mixture seems complete. Pulls out in strings more than any other mixture used.

Moulded best with press platten water at 155°F
Varnished and baked regular - fell down and crumpled up completely.

D-160

Rosin	15%	630 g
Manila Copal	15%	630
dust Cotton	6%	252
Chalk	64%	2688

Circulating water in press platens 158°F

Laminated and baked regular
warped about 1" out of plane

D-161

Rosin	10%	70g
Manila	10%	70 g
Cotton	10%	70 g
Chalk	70%	490
		700g

Mixed on rolls - did not leave the rolls at high enough temperature to press out into a blank. Mixed very easily.

D 162

Rosin	12%	84 g
Manila	12%	84 g
Cotton	10%	70 g
Chalk	66%	462 g
		700 g.

420

42g chalk left over 6% could not get in all – too dry

D 163

Rosin	7%	49 g
Manila	21%	147 g
Cotton	10%	70
Chalk	62%	434

344

90 g chalk would not go in – 7 reads good condition, gone; as dry as can be worked.

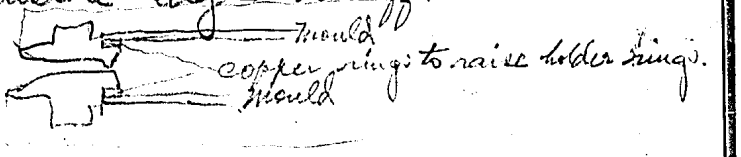
D 164

Rosin	13%	91
Manila	13%	91
Coffee	6%	42
Chalk	68%	466

put in all but 1/2 chalk –

Varnished and baked regular
warped 3/8" out of plane

two old bevel rings one left in original form and the other filed off all except a very narrow ridge at inside edge to cut off;



both prints smooth surface cracks marked by parallel line on records.

D-165 see also 163

Rosin	8%	56 g
Manila	22%	154 g
Cotton	8%	56 g
Chalk	62%	434 g
		700 g

Worked good - got looks a little dark in color.

Varnished and dried regular perfectly flat.

Rosin	I grade	336
Manila Copal		924
Dust cotton -		336
Chalk -		2604
		4200 for 3 gal mix

works O.K. but gets stiffer with longer mixing - see D 169

Varnished and dried regular perfectly flat.

Printed regular - but in "flash mould" (see other side) - Full print - stuck in holder fine radial crack to center of ammic (due ?) to sticking on edge of mould holder.

2 prints both cracked Oct 22-18

(125)

D-166

Manila	32%	224
Cotton	8%	56
chalk	60%	420
		700

Varnished and dried regular perfectly flat –
Cracked in removing print from mould – beautiful perfect print otherwise –

2d print cracked in mould probably in cooling

D-167

Manila	30%	210
Cotton	8%	56
Chalk	62%	434

Made O.K. blank, varnished and baked regular remained perfectly flat.

Very smooth surface but cracked in press and stuck on label —

tried	water	milky white precip. dissolves a large proportion
	denatured alcohol	dissolves less than water
	Solvent Naptha	
	Turpentine	
	Benzol	
	Benz aldehyde	
	Nitro Benzol	
	Palmitic acid	
	acetic acid	dissolves a little better than water
	acetone	
	Ammonia 2.3% soptus	
	Oleic acid	
	Stearic acid	
	Trichlorophenol	
	Amyl acetate	
	Straw oil	

D 168

Gum Olibanum

not soluble to any extent in ~~any~~ Rosin, Manila Copal or Stearic acid. Acetic acid dissolves most of it and water nearly as much as acetic acid. All of the ordinary solvents for gums dissolve only a small fraction even when heated.

Heat decomposes nearly all of it before melting. It is softer than beeswax at 100°F. (chewing it) tastes like rosin seems to be a mixture of rosin and a very unstable water soluble substance.

A-169

Rosin	8% x 7	56
Manila	24%	168
Cotton	8%	56
Cloth	60%	420
		700

Rosin	336
Manila	1008
Cotton	336
Cloth	2520
	4200

D-170

Stearic Acid	8% ×7	56g
Manila	24%	168
Cotton	8%	56
Chalk	60%	420
		700

Very sticky stuck to mould below 100°F after 24 hours still soft enough to bend tough almost like celluloid.

too much Stearic Acid

seems greasy

D-171 Oct 19-1918

Stearic acid	2%	14 g
Manila Copal	24%	168 g
Cotton dust	8%	56 g
Chalk	66%	462 g
		700

Left mixer cleaner than any other mixture.
Made O.K. blank. Water 106°F

Stearic Acid	84 g
Manila	1008 g
Cotton Dust	336 g
Chalk	2772 g
	4200

Oct 21 tried large mixer but reducing valve out of order delayed and batch was ~~[illegible]~~ cooked too much? made too dry mix.

Oct 22 tried small mix again and got too dry due to slow work something cooks off or a chem. change takes place, varnished and baked regular warped in baking
Print O.K. except P.O. on label

C137J

D-172

Stearic Acid	3%	21 g
Manila Copal	24%	168
Cotton	8%	56
Chalk	65%	455
		700

D-173

Flake Naphthalene	3%	21g
Manila Copal	24%	165g
Cotton	8%	56g
Chalk	65%	455g

25g chalk left out could not get it in too dry

C141J

D-174

Flake Naphthalene	4%	28
Manila Copal	26%	182
Cotton	8	56
Chalk	62%	434
		700

Made a blank but too dry

Made OK. print no cracks but P.O. on label on one side. Surface OK except for defects apparently in mould.

D 175

Flake Napthalene	~~14~~ %	14
Stearic acid	2 %	14
Manila Oil	24 %	168
Cotton dust	8 %	56
Chalk	64 %	448

Made OK blank but a little too stiff
varnished and baked regular
warped in baking
Painted [illegible] OK. ex. P.O.
on one side in [illegible].

Examined two 4 - all around margin
seems mottled as if it were going to
crack later like D-151

D-176

Flake Napthalene	2%	14
Stearic Acid	2%	14
Rosin	2%	14
~~Manila~~ Copal	22%	154
~~Cotton~~ dust	8%	56
Chalk	64%	448
		700

Made OK. Blanks –
Print OK. ex. P.O. on label

D 177

Stearic Acid	2%	14	84
Rosin	4%	28	168
Manila Copal	22%	154	924
Cotton dust	8%	56	336
Chalk	64%	448	2688
		700	4200

Made O.K. blank - good consistency.
Large mix was too stiff to press out. Only got one O.K. blank out of it.
Varnished and baked regular warped in baking
Print ok ex-p.o. in lable on one side and large spot on music apparently defect in mixing small mixer.
Print from large mixer marked D-177 L.M. - OK ex p.o. on label

D 178

Stearic Acid	2%	14
Rosin	4%	28
Manila	22%	154
Cotton	8%	56
*Magnesium Silicate	64%	448
		700

Varnished and baked regular
warped in baking
Print OK. ex Full auto
on label and margin
Margin looks like (178) 2004-18

D-179

Manila Copal	30%	210	1260
Cotton	8%	56	336
Magnesium Silicate	62%	434	2604
		700	4200

too soft -

Made OK Blank, but heat 1/4 in oven - varnished and baked regular -

Printed regular - OK except label pull out, good surface

D-180

Stearic Acid	6%	42
Manila Copal	18%	126
Cotton	8%	56
Chalk	68%	476
	100 —	700

Combinations with Manila Copal.

D 181

Palmitic acid mixes in all proportions. makes very soft in large amts. Smaller amts mixture will bend but still very brittle.

Sofo Mexican Asphalt mixes in all proportions all very brittle.

Zinc Stearate - dissolves but does not alter brittleness.

Tetra chlor napthalene dissolves but does not alter brittleness, turns whitish after 24 hours.

Carnauba wax dissolves - no apparent change

Japan wax dissolves, foams, sticks to plate more but does not alter brittleness.

Spermaceti - insoluble or nearly insoluble.

Sperm oil - insoluble or nearly insoluble.

Bees wax. not a solvent.

Chinese wax. not a solvent.

Palm wax. not a solvent.

"Bayberry wax" (probably Myrtle wax) fair solvent but brittle ~~in~~ small amts.

Tallow solvent but not quite as good as stearic acid.

Stearic Acid
Palmitic acid } all good solvents - palmitic best.
Oleic Acid

Asphalt oil fine solvent but brittle in small amounts.

D-181

Combinations of other things with Manila Copal-

Colza oil
Cotton seed oil
Sesame oil
Linseed oil
Poppy seed oil
Castor oil
Palm oil
Cocoanut oil
Neats foot oil
China wood oil. } all dissolve Manila Copal when hot. and large amts make a rubber like mass but when small amts are used mass bends but is very brittle. China wood oil seems to be the best and castor oil next.

Paraffine will not mix with Manila

Straw oil mixes and softens but is apparently not a solvent as it turns whiteish on cooling.

Stearic Acid Methyl Ester is the best solvent so far tried. small amount required to soften leaves perfectly clear mass. Small quantities do not remove the brittle quality of manila Copal.

Hexamethylene Tetramine 6/4 makes foamy light brown brittle mass - seems to combine.

Para phenylenediamine black brittle mass.

B napthol & a napthol - dissolve and have a slight softening effect

Acetanilid - dissolves - slight effect if any

Benzoic Acid - dissolves - softens.

D 181 Continued

Tannic acid - (insoluble)
Rosalic acid - dissolves foams slight physical change if any at all.
Sodium acetate - does not mix
Cupric Ammonium Sulphate - partly soluble no physical change -
Salicylic Acid - dissolves but crystalizes out on cooling.
Copper Stearate dissolved but heat required to make fluid reduces metalic copper - ~~[illegible]~~ ~~[illegible]~~ seems to free stearic acid which softens the manila Copal.
Phenol - softens but requires a large amt.
Trichlorophenol - has slight effect.

Rosin soap (with no free alkali or free rosin) makes the mass almost as brittle and weak as rosin about 25% used.
Benzidine - leaves the dish - no other physical change
Anthracin (crude) dissolves - no appreciable phys. change -
Carbazol - dissolves - " " " "
Phenanthren " " " " "
Phthalic Anhydride " " " " "
β Naphthylamine " " " " "
Phenol tribromid " " " " "
Perchlorbenzol " " " " "

D 181 Continued.

Tartaric acid dissolves - leaves the dish - no other physical change.
Acetanalid - dissolves - no physical change.
Perchlorbenzol - " " " " .
Dioxy naphthalene " " " "
Borax will not mix.
Boric Acid - dissolves - leaves the dish - makes the rosin considerably stronger
Benzoic Acid clarifies and makes so that it will bend without breaking.
Benz Phenol softens something like phenol.
Rosin Soap - makes as brittle as rosin leaves the dish clean.
Bulls hit mixes well is very brittle if hard enough to be of use. about half and half is as hard and brittle as rosin.

Saponified Manila Copal - saponified with caustic soda double precipitated with salt - washed and dried acts like rosin soap.
Para chlor aniline - softens only in very large amts
Hexachlorathan Brittle & no physical change
Benzidine Base " " " "
Saponified Olibanum Gum - 25% shows no appreciable effect
Aniline oil makes very tough rubbery mass

D-182 — Standard Oil Co.

Asphalt Oil	4%	28g
Manila Copal	24%	168
Cotton dust	8%	56
Chalk	64%	448
	100	700

(390)

~~too~~ dry 58g would not go in

See (184)

D-183

Benz Phenol	4%	28 g
Manila Copal	24%	168 g
Cotton Dust	8%	56
Chalk	64%	448
	100	700

too dry see D-185

D-184

Asphalt oil	4%	28g
Manila Copal	28%	196
Cotton	8%	56
Chalk	60%	420
		700

Taken directly from mixer to press the outside of gob is very dark while the "cracked" surface as press stretches gob is very light color.

Varnished and baked regular coarped 1/2 end

D-185

Benz Phenol	28 g	4%
Manila Copal	182	26%
Cotton dust	56	8%
Chalk	434	62%
	700	100

Varnished and baked regular - warped 3/4 inch.

D-186

Boric Acid Crystl.	4%	28 g.
Manila Copal	26%	182
Cotton dust	8%	56
Chalk	62%	434

A little too dry but made an O.K. Blank -

Varnished and baked regular did not warp.

D-187 see (D-179) and (D-186)

Boric Acid crystals.	4%	28 g.
Manila Copal.	26%	182
Cotton dust.	4%	28
Gas black.	2%	14
Magnesium silicate	64%	448
	100	700

Printed blanks without varnishing - cracked and showed a tendency to stick all over but surface about as good as with varnished blanks.

D-188

Boric Acid crystal	4%	28g.
Manila Copal	28%	196
Cotton dust	4%	28
Magnesium Silicate	64%	448
	100	700

Varnished and baked regular warped about 3 inches

D-189

Asphalt Oil	4%	28 g
Boric Acid	4%	28 g
Manila Copal	28%	196
~~Cotton Dust~~	4%	28
Magnesia Silicate	60%	420
	100	700

~~Varnished~~ and baked regular
crumpled up in oven

D-190

Boric Acid	4%	28 g
Stearic Acid	2%	14
Manila Copal	26%	182
Cotton dust	8%	56
Magnesium Silicate	60%	420
	100	700

varnished and baked regular
sampled up in oven.

D-191

Boric Acid	4%	28 g
Manila Copal	24%	168
Phenol	4	28
Cotton dust	8	56
Magnesia Silicate	60	420
	100	700

a little too dry

D-192

Boric Acid	4%	28 g.
Manila Copal	26%	182
Phenol	4%	28
Cotton dust	8%	56
Magnesia Silicate	58%	406
	100	700

too soft – press 120° –
stuck to ~~platen~~ slightly.
varnished and baked regular –
folded three times in oven – very soft.

C101

Proportions.	lbs.		Grammes for 3 gal mixer
3 chalk.	43	× 40	1720
4 wood.	57		2280
8/10 Rosin.	12		480
Alcohol	50	Kerosene 47½	1900
		Alcohol 2½	100
Gas black	2		80

D-193 Nov 12-1918

1720 g Chalk
2280 g wood flour
480 g Rosin
1900 g Kerosene
100 g Alcohol
80 g gas black.

Kerosene heated on steam plate alcohol added then Rosin (ground fine) stirred in until all is dissolved.

Wood flour put in mixer first.

Rosin solution poured on gradually well mixed then chalk sifted on mixed well then gas black added and mixed until all is uniformly black. – too much was taken for the mixer capacity – and mixing was not as good as with a smaller batch – see opposite page. –

Put in vacuum drier 26" vacuum 3⁵⁵ pm

Steam pressure on pans {35 lbs. 281° F
{40 lbs 287° F

Made a blank – oil stewed out all over press with most of the Rosin

D-194

Resin 15%	×7	105	×6	630
Cotton 8%		56		336
Chalk 77%		539		3234
		700		4200

Small mix ground then coffee mill and proceed for regular mounted microscope phases cotton fibers between the grains.

C185J

D-195

Manila Copal	10% × 7	70
Rosin	10	70
Cotton	8	56
Chalk	72	504
		700

ground and moulded like
D-194 — same results —

D-196 (see D 125)

Manila Copal	13% x 7	91 x 6	546
Rosin	20%	140	840
Cotton	15%	105	630
Chalk	52%	364	2184
		700	4200

D-197

Sheet of white blotting paper prepared for D-13 - May 31 - 1918 - Coated with 2 coats regular black varnish and baked regular, placed on each side of a D-125 blank and printed regular. One side stuck on label and P.O. other side O.K. Printed Nov 14-1918

C1910

— Accumulator Data —

6" Ram = 28,274 square inches,

with bottom disc on only gauge reads 120 lbs

1st row of blocks 8 wts 320 lbs ea 2560 lbs

2560 ÷ 28,27 = 91½ lbs. gauge reads 210 lbs

2d row of blocks - 8 wts 320 lbs " " 305 lbs

3d row of blocks 8 wts 230 lbs 1840

2 wts 320 640

Calculated 88 lbs 2480 lbs

gauge reads 405

4th row 8 wts 230 = 1840 = 86 lbs per sq in -

gauge reads 465

5th row 8 wts 230 = 1840 gauge reads 525

1st wt on top " " 560

2 large wt on top " " 660

3d wt on top " " 680

4th wt on top " " 700

Sept 4 rows 16 platters pump running 850 "

13-1918 10 rows 140 platters " " 925 " 850

readings taken with pump stopt -

accumulator going up friction

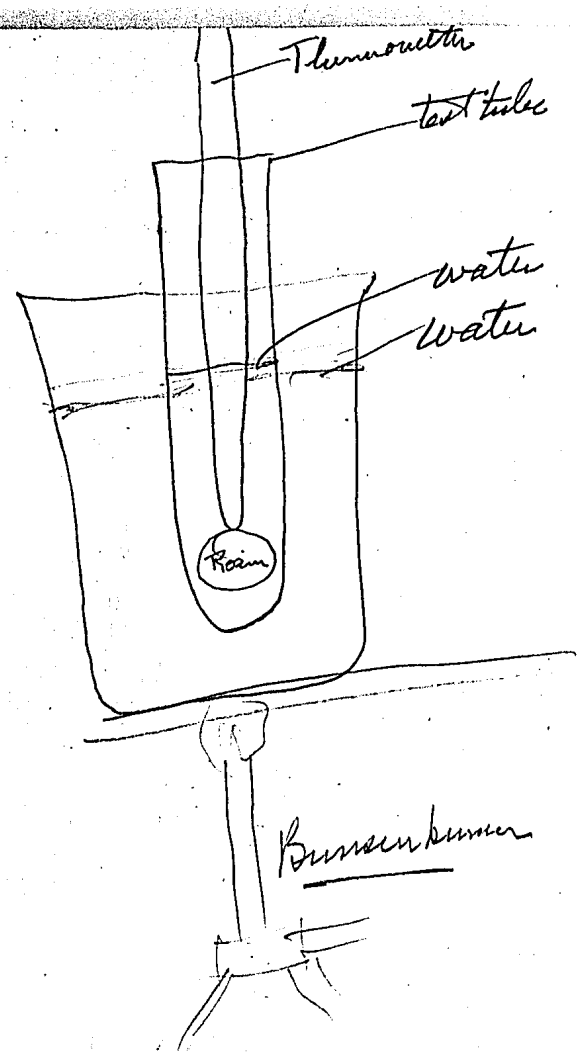
in gland adds about 25 lbs -

Put one gallon lubria in the

water Aug 24-18 -

sketch opposite

Grade I Rosin — Test by L. Ott,
at 52°C = 126° F the thermometer, when slightly pressed against the rosin just makes an impression.
at 57°C = 135°F Thermometer starts to sink in a little of its own weight
at 75°C = 167°F The rosin is like very heavy vaseline or tar,
at 90°C = 194°F it is about like soft leather.
at 100°C = 212°F the rosin adhering to the thermometer begins to leave and rise to the surface of the water,



Mixing Machine table –

Motor 1150 R.P.M. 4 3/4" pulley

(3 pint) Small mixer 125 RPM 12" pulley

(3 gal) Large mixer 165 RPM 23" pulley

Small mixer drive 6" pulley

Large mixer drive 15" pulley

Main drive pulley 21"

[ITEM(S) FOUND IN BOOK]

Suggestion

Suppose you try an experiment of melting several
till all fluid — set aside in jacket to cool very slow, say 3...
4 hours, break a hole + pour out the liquid part leaving
1/2 + R2 melt this do same thing pour out 1/2 — + so
on — Then you can note degs of Crystallization of
the 3 or 4 Crystallizations — perhaps it is a good
thing up to do it. Come no recollecting of
you succeed.

Mr. Edison:

I have been over the Edison oil
situation thing in New York with the Army
Standard and people.

They make it out of Yellow Castile
received by other companies at Marseilles,
bottle & ship. The reason they receive so
great revenue. "Prime City Italian" is also
made in Italy. Very high quality. Very
fine. They pay a duty on it
& should you not believe the here that
distillated Castile oil is not as good as
the old standard for "Prime City Italian"
The way that the Marseilles Castile
Stearate is made from pure olive oil, then,
and that the fine Vegetable oil
probably has 4 months stearin.

In cold freezing the heavy matter of the
oil is frozen out but the stearin
is a heavy proportion of matter in present
it makes the Yellow Castile and the
oil is not frozen out so perfectly.
This causes some considerable trouble
in cold weather, but in warm weather
they have no trouble from it in the
cold freezing.

[ITEM(S) FOUND IN BOOK]

After cold pressing it is hot pressed twice, each time the edges of the cakes are trimmed off and returned to an earlier stage in the process.

They say that to make a special lot they would have to run 200,000 lbs of tallow to get 25,000 lbs in the center of the lot not blended more or less with what's good before or after.

They will send me samples made after the first warm weather, and will look out for lots with coarse crystals etc, noting conditions under which they were made and let me tell them which are best.

The press cakes are melted up in a large pot and then boiled into kettles where it is stirred mechanically to make it cool to just above melting point throughout then poured in pans.

They have not changed any of their process in years.

Very respectfully,

Geo. Dimmiddie

[ITEM(S) FOUND IN BOOK]

Magnesium Silicate blanks —
Different proportions Rosin

Blank number	% Rosin	temperature of water in press
142	28%	120°F - 122°F - 125°F - 126°F
134	30%	120°F - 121°F - 124°F - 126°F
139	32%	120°F - 122°F - 123°F - 126°F
141	34%	120°F - 120°F - 122°F - 124°F

30% is best